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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,748	08/05/2003	Robert J. Bolender	SYNA-20030715-01	9656

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EXAMINER

BECK, ALEXANDER S

ART UNIT	PAPER NUMBER
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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/635,748

Applicant(s)

BOLENDER ET AL.

Examiner

Alexander S. Beck

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper-No(s)/Mail Date _____

- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 20061229.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Pre-Appeal Brief

1. Acknowledgment is made of the Pre-Appeal Brief filed by the Applicant on July 6, 2006. Applicant's arguments pertaining to Bick's failure to teach the capacitive sensor integrated within the keymat has been carefully considered and is found to be persuasive. Accordingly, prosecution for the instant application is reopened.

However, upon further consideration, new grounds of rejection are made in view of Bick (U.S. Patent No. 6,924,789 B2). Specifically, capacitive sensor 19 is integrated within keymat 27,28,29,30 (BICK: column 2, line 35 – column 3, line 29). Claims 1-68 are currently pending in U.S. Application Serial No. 10/635,748, and an Office Action on the merits follows.

Response to Telephonic Communications on December 27, 2006

2. Applicant's request for reconsideration of the finality of the rejection of the last Office Action (i.e. the final Office Action mailed on October 19, 2006) is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. **Claims 39,40 and 43** are rejected under 35 U.S.C. 102(e) as being anticipated by Bick (U.S. Patent No. 6,924,789 B2, hereinafter BICK).

As to independent **Claim 39**, BICK teaches/suggests an integrated keypad assembly in **Figures 3,4** for an electronic device comprising: a keypad structure **17,18**; a keymat **27,28,29,30** that is deformable to actuate a switch sensor **33a,33b**; and a capacitive sensor **19** that is coupled to said keymat **27,28,29,30** and said keypad structure **17,18**, wherein said capacitive sensor **19** is integrated within said keymat **27,28,29,30** (BICK: column 2, line 35 – column 3, line 29).

As to **Claim 40**, BICK teaches/suggests wherein said capacitive sensor **19** comprises sensors having at least a portion thereof disposed around an area to be lighted (BICK: column 1, line 59-61; column 2, line 35 – column 3, line 29).

As to **Claim 43**, BICK teaches/suggests in **FIGs. 3,4** wherein said keymat **27,28,29,30** is deformable to actuate said switch sensor **33a,33b** via a key post **32a** (BICK: column 2, line 35 – column 3, line 29).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly

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owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claim 41** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bick (U.S. Patent No. 6,924,789 B2).

As to **Claim 41**, note the discussion of BICK as detailed in the above paragraphs regarding independent Claim 39.

BICK does not disclose expressly wherein said keymat comprises a rubber material.

BICK teaches/suggests wherein said keymat **27,28,29,30** comprises an adhesive material **27,28,30**. The Examiner takes Official Notice that the use of a rubber-based adhesive is old and well known in the art.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the integrated keypad assembly of BICK such that the adhesive material was a rubber-based adhesive.

The suggestion/motivation for doing so would have been because rubber-based adhesives are known to be used in a variety of electronic devices for providing protection against electrostatic discharge (ESD), electromagnetic interference (EMI), or radio frequency interference (RFI).

7. **Claims 1-4,13-15,21,25,26,44-46,55-59,67 and 68** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bick (US 6,924,789 B2) in view of Seely et al. (US 6,188,391 B1, hereinafter SEELY).

As to independent **Claim 1**, BICK teaches/suggests a capacitive sensing device in **Figures 3,4** for use in a keypad assembly of an electronic system, said capacitive sensing device comprising: a substantially transparent capacitive sensor **19,28**, said substantially transparent capacitive sensor **19,28** configured to be disposed within said keypad assembly without requiring the formation of key post holes therethrough; said substantially transparent capacitive sensor **19,28** is coupled to a keymat **27,29,30** and a keypad structure **17**, said substantially transparent capacitive sensor **19,28** integrated within said keymat **27,29,30**; and said substantially transparent capacitive sensor **19,28** having a flexibility which enables desired tactile response during use of keys **17,18** of said keypad assembly (BICK: column 2, line 35 – column 3, line 29).

BICK does not disclose expressly wherein said substantially transparent capacitive sensor is a single sheet.

SEELY teaches/suggests a capacitive sensor in **Figures 6-8B**, analogous in art to the teachings of BICK in that both are directed towards detecting user input in a semiconductor device through the use of capacitor type sensors, with a patterning of sensors that consolidates the conventional horizontal layer of sensors and vertical layer of sensors into one single sheet layer (SEELY: column 5, lines 48-59).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the substantially transparent capacitive sensor of BICK, such that the sensors were patterned as taught/suggested by SEELY to consolidate the sensor into a single layer.

The suggestion/motivation for doing so would have been to achieve a compact capacitive sensing device that significantly reduces the cost of production without adversely affecting its functionality (SEELY: column 2, lines 15-25).

As to **Claim 2**, BICK teaches/suggests in **Figures 3,4** wherein said substantially transparent capacitive sensor **19,28** comprises a substantially transparent substrate **28** wherein the patterning of capacitive sensors **22,24** is comprised of a substantially transparent material and is disposed above said substantially transparent substrate **28** (BICK: column 2, line 35 – column 3, line 29).

Furthermore, as discussed above SEELY discloses a capacitive sensor with a patterning of sensors that consolidates the conventional horizontal layer of sensors and vertical sensors into one single sheet layer. Specifically, SEELY teaches/suggests in **Figures 6-8B** a first pattern of conductive sensors **68,69** disposed within a sensing region; a second pattern of conductive sensors **68** (“floating”) disposed within said sensing region, said first pattern of conductive sensors **68,69** and said second pattern of conductive sensors **68** (“floating”) disposed in a common single layer; and a plurality of conductive bridges **104** disposed to electrically couple portions of said second pattern of conductive sensors **68** (“floating”) (SEELY: column 5, line 48 – column 7, line 11).

Therefore, when the teachings of BICK and SEELY are combined for the reasons stated above, it is inherent that the first and second patterns are disposed above the transparent substrate (see first paragraph addressing Claim 2) and the conductive sensors are comprised of a substantially transparent material (because the embodiment of Bick requires the transmission of light through the capacitive sensors).

As to **Claim 3**, SEELY teaches/suggests wherein said plurality of conductive bridges is opaque (SEELY: column 5, line 48 – column 6, line 31).

As to **Claim 4**, BICK teaches/suggests wherein said substantially transparent material comprises indium tin oxide (BICK: column 2, line 53-58).

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As to **Claim 13**, note the above discussion with respect to Claims 1 and 2. Neither BICK nor SEELY disclose expressly wherein said plurality of conductive bridges is selectively disposed to lessen visual interference with indicia of said keys of said keypad assembly.

In order to establish obviousness under 35 U.S.C. 103, it must appear that the state of relevant prior art was such that the claimed invention would have been obvious to one of ordinary skill in the art; in judging ordinary level of skill in the art, it is the level of skill of those who normally attack the problems of the art that counts; persons who do most of the problem solving in involved art are graduate engineers; as such they are chargeable with general knowledge concerning principles of engineering, outside the narrow field involved, and with skills, ingenuity, and competence of the average professional engineer. Mueller Brass CO. v. Reading Industries, 176 USPQ 361, 372 (1972).

In the instant case, the teachings of BICK and SEELY are combinable for the same reasons set forth in the paragraphs regarding Claims 1 and 2. BICK requires the capacitive sensor **19** to be substantially transparent so as to permit a light emitted from EL layer **29** to penetrate therethrough and illuminate indicia on the keys **18** (BICK: column 2, line 35 – column 3, line 29). However, SEELY teaches/suggests electrically connecting portions of a second patterning of capacitive sensors through the use of opaque conductive bridges (SEELY: column 5, line 48 – column 6, line 31).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to selectively dispose the conductive bridges so as to lessen visual interference with indicia on the keys **18**.

The suggestion/motivation would have been because a graduate engineer, with the ingenuity and competence of the average professional engineer, would understand that a fundamental problem occurs when combining the teachings of BICK and SEELY. Specifically, disposing an opaque material in between an EL layer emitting a light source and an indicia on a key would disadvantageously block a portion of the emitted light, thus reducing the brightness at the surface of the key as perceived by an

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individual. Therefore, going back to the original problem, a fundamental solution is to minimize the occurrence of the opaque material disposed in between the EL layer emitting a light source and the indicia on the key, resulting in the limitations as presently claimed.

As to independent **Claim 14**, all of the claim limitations have already been discussed and met by references BICK and SEELY, as detailed in the above paragraphs regarding Claims 1 and 2.

As to independent **Claim 58**, all of the claim limitations have already been discussed and met by references BICK and SEELY, as detailed in the above paragraphs regarding Claims 1 and 2.

As to **Claims 15,21,25,26,44-46,55-57,59,67 and 68**, all of the claim limitations have already been discussed and met by references BICK and SEELY, as detailed in the above paragraphs regarding Claims 1-4 and 13.

8. **Claims 5-12,16-20,22-24,47-54 and 60-66** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bick (US 6,924,789 B2) and Seely et al. (US 6,188,391 B1) as applied to Claims 1,2,14,15,39,44,45 and 58 above, and further in view of Kleinhans et al. (US 6,664,489 B2, hereinafter KLEINHANS).

As to **Claims 5 and 10**, note the above discussion with respect to Claims 1 and 2. Neither BICK nor SEELY disclose expressly wherein the first and second patterns of conductive sensors further comprise: at least a portion comprised of a substantially opaque conductive material electrically coupled to said substantially transparent material of said first and second patterns of conductive sensors.

KLEINHANS teaches/suggests a capacitive sensing device in **Figures 1-3**, analogous in art to the teachings of BICK and SEELY in that all are directed towards detecting user input in a semiconductor device through the use of capacitor type sensors, wherein a substantially transparent conductive sensor **12** comprises at least a portion comprised of a substantially opaque conductive **23** material electrically coupled to the substantially transparent conductive sensor **12** (KLEINHANS: column 3, line 66 – column 4, line 9).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the capacitive sensing device of BICK and SEELY, such that the first and second patterns of conductive sensors comprise at least a portion comprised of a substantially opaque conductive material electrically coupled to said substantially transparent material of the first and second patterns of conductive sensors, as taught/suggested by KLEINHANS.

The suggestion/motivation for doing so would have been to represent indicia on a surface to be viewed by a user through light emitted by a light-emitting surface (KLEINHANS: column 3, line 66 – column 4, line 9).

As to **Claims 6 and 12**, KLEINHANS further teaches/suggests in **Figures 1-3** wherein said portion of said substantially opaque conductive material further comprises openings **22** extending therethrough such that light is able to pass through said openings **22** of said substantially opaque conductive material (KLEINHANS: column 3, line 66 – column 4, line 9).

As to **Claim 7**, SEELY teaches/suggests wherein said first pattern of conductive sensors is disposed to minimize capacitive interference with at least one of said plurality of conductive bridges (SEELY: column 4, lines 47-52).

As to **Claims 8 and 11**, KLEINHANS further teaches/suggests in **Figures 1-3** wherein said portion of said substantially opaque conductive material **23** overlies at least a portion of said substantially transparent material of said conductive sensors **12** (KLEINHANS: column 3, line 66 – column 4, line 9).

As to **Claim 9**, KLEINHANS does not disclose expressly wherein the opaque material is conductive ink. SEELY teaches/suggests wherein a substantially opaque conductive material comprises conductive ink and is disposed on the surface of the single sheet conductive sensor (SEELY: column 5, line 48 – column 6, line 54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the opaque material of KLEINHANS, such that it was conductive ink, as taught/suggested by SEELY. The suggestion/motivation for doing so would have been because carbon ink is an inexpensive process (SEELY: column 5, line 48 – column 7, line 11).

As to **Claims 16-20,22-24,47-54 and 60-66**, all of the claim limitations have already been discussed and met by references BICK, SEELY and KLEINHANS, as detailed in the above paragraphs regarding Claims 5-12

9. **Claim 42** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bick (US 6,924,789 B2) in view of Kleinhans et al. (US 6,664,489 B2).

As to **Claim 42**, all of the claim limitations have already been discussed and met by references BICK and KLEINHANS, as detailed in the above paragraphs regarding Claims 5-6.

10. **Claims 27-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bick (US 6,924,789 B2) in view of Seely et al. (US 6,188,391 B1) and Kleinhans et al. (US 6,664,489 B2).

As to independent **Claim 27**, all of the claim limitations have already been discussed and met by references BICK, SEELY and KLEINHANS, as detailed in the above paragraphs regarding Claims 1,2 and 5.

As to **Claims 28-38**, all of the claim limitations have already been discussed and met by references BICK, SEELY and KLEINHANS, as detailed in the above paragraphs regarding Claims 3,4 and 6-13.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Alexander S. Beck** whose telephone number is (571) 272-7765. The examiner can normally be reached on M-F, 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Sumati Lefkowitz** can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

asb
12/29/06


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